

Geometry Final Review

Semester 1

Name: _____

Date: _____ Pr: _____

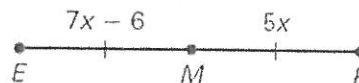
FAILURE TO SHOW ALL WORK AND WRITE IN COMPLETE SENTENCES WILL RESULT IN LASALLE!

1) Define the following in **three separate** complete sentences: a) point, b) line, c) plane

2) Find KM .



3) Find MF .



Use the description of a number line below to answer questions 4 – 5.

On a number line, point W is located at 3, X is located at -5 , Y is located at -16 , and Z is located at 11.



4) What is the distance, in coordinate units, between points W and Z ?

5) What is the distance, in coordinate units, between points W and Z ?

6) Write the midpoint formula:

7) Write the distance formula:

8) Find the coordinates of the midpoint of the segment with the given endpoints.

a. $R(3, 1)$ and $S(3, 7)$

b. $V(2, 4)$ and $W(6, 6)$

9) Find the distance of the segments with the given endpoints. **Leave your answers in reduced radical form.**

a. $A(-6, 4)$ and $B(0, 7)$

b. $X(-1, 8)$ and $Y(6, 1)$

10) Find the values of x that satisfy the following equation:

$$2|2x - 3| + 6 = 12$$

11) Find the solution set of $2|6m + 5| - 1 = 25$

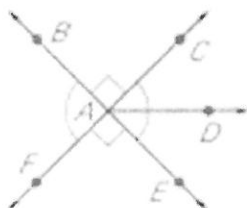
- Find the distance between the two values for m .
- Find the sum of the two values for m .

12) What is the solution of the inequality $|10 - 3x| + 2 \leq 2$?

- $\{x \leq -3 \text{ or } x \leq \frac{29}{3}\}$
- $\{x \leq -3 \text{ or } x \geq \frac{29}{3}\}$
- $\{-3 \leq x \leq \frac{29}{3}\}$
- $\{-3 \leq x \leq 11\}$
- $\{-3 \leq x \geq \frac{29}{3}\}$

13) Solve the inequality $3|2x - 16| + 6 > 36$

14) Name the acute angles in the given figure:



15) Which of the following is vertical to $\angle LQK$?

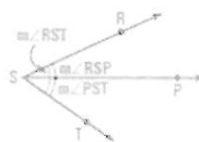
- $\angle LQM$
- $\angle MQN$
- $\angle NQK$
- $\angle QMN$



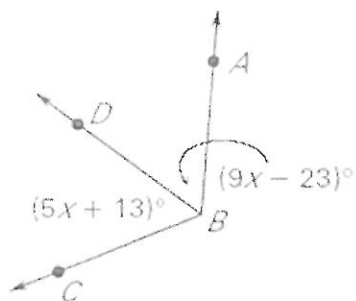
16) Use the following **together** in a complete sentence:

- bisecting line, b) angle, c) congruent

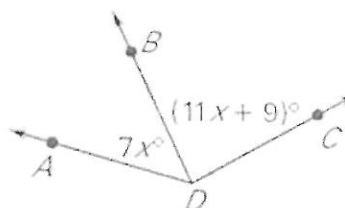
17) Make a statement using $\angle RSP$, $\angle PST$, and $\angle RST$ that demonstrates the angle addition postulate.



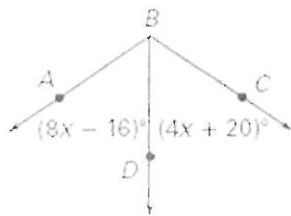
18) BD bisects $\angle ABC$. Find $m\angle ABC$.



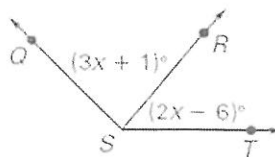
19) Given $m\angle ADC = 135^\circ$, find $m\angle BDC$.



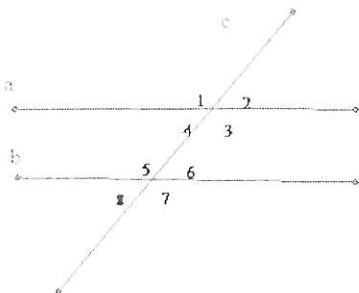
20) BD bisects $\angle ABC$. Find $m\angle ABC$.



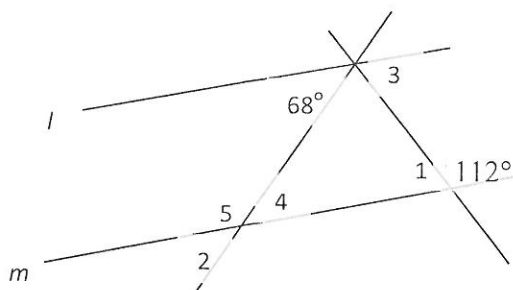
21) Given $m\angle QST = 135^\circ$, find $m\angle QSR$.



22) List all the pairs of congruent angles if lines a and b are cut by transversal c .

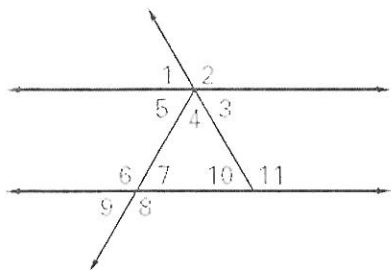


23) In the figure below, lines l and m are parallel. Which of the following angles does not have a measure of 68° ?



- A. $\angle 1$
- B. $\angle 2$
- C. $\angle 3$
- D. $\angle 4$
- E. $\angle 5$

24) In the figure below lines a and b are parallel, and $m\angle 1 = 47^\circ$. Find the measure of $\angle 11$.



- a. 43°
- b. 47°
- c. 133°
- d. 313°
- e. Cannot be concluded from given information

25) Which statement is true of the given lines?

Line A: $-3x + y = 5$

Line B: $x + 3y = 2$

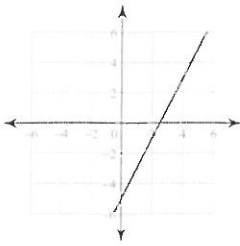
Line C: $2x + 3y = 5$

- A) Lines a and b are parallel
- B) Lines a and b are perpendicular
- C) Lines a and c are parallel
- D) Lines a and c are perpendicular
- E) Lines b and c are perpendicular

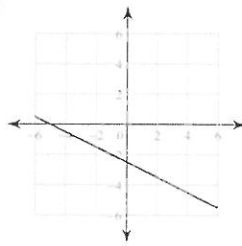
26) Which graph represents the equation given?

$$y = 2x + 5$$

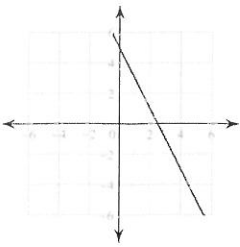
A)



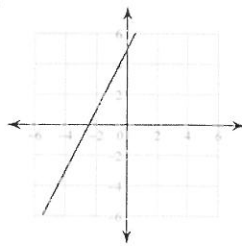
B)



C)



D)



27) Write the slope equation.

28) What is the **slope** of the line that passes through the points (4, 5) and (-3, 0)?

29) What is the **equation** of the line that passes through the points (-2, -1) and (3, 6)?

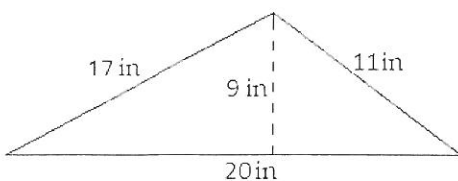
30) What is the **equation** of the line that passes through the points (0, -4) and (-2, 1)?

31) What is the equation of the line that is **parallel** to $y = 2x + 4$ and passes through the point (0, -1)?

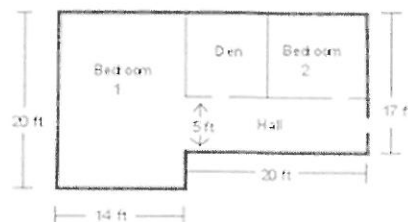
32) Fill in the following formulas.

	Perimeter	Area
Triangle	$P = s_1 + s_2 + s_3$	
Square		
Rectangle		
Circle		

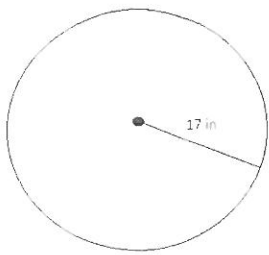
33) Find the **perimeter and area** of the triangle below.



34) Find the **perimeter and area** of the floor plan below.



35) What is the circumference of the circle?

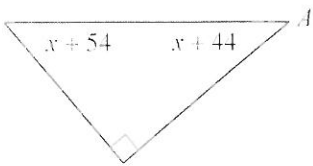


36) What is the length of the radius of a circle with an area of 196π cm?

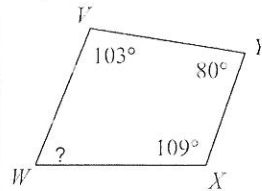
37) What the sum of the interior angles of a triangle?

38) What is the sum of the interior angles of a quadrilateral?

39) Find the measure of angle A.



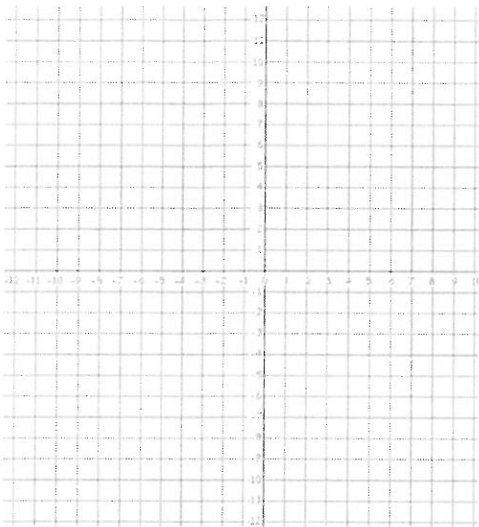
40) What is the measure of angle W in the figure below?



Failure to show all work and write in complete sentences will result in LaSalle!

1. Graph the following quadratic equation.

$$y = -\frac{1}{2}x^2$$

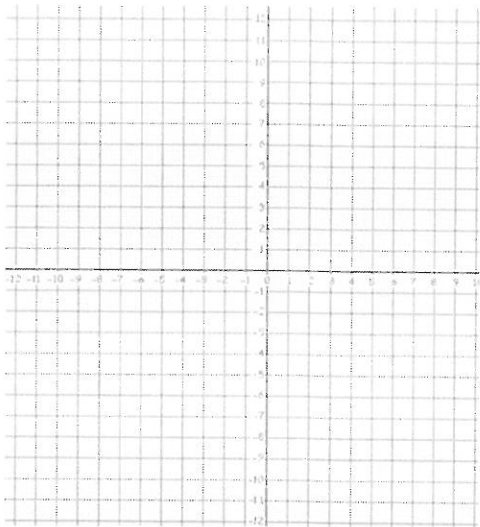


x	y

Comparison to $y = x^2$:

2. Graph the following quadratic equation.

$$y = -3x^2 + 6$$



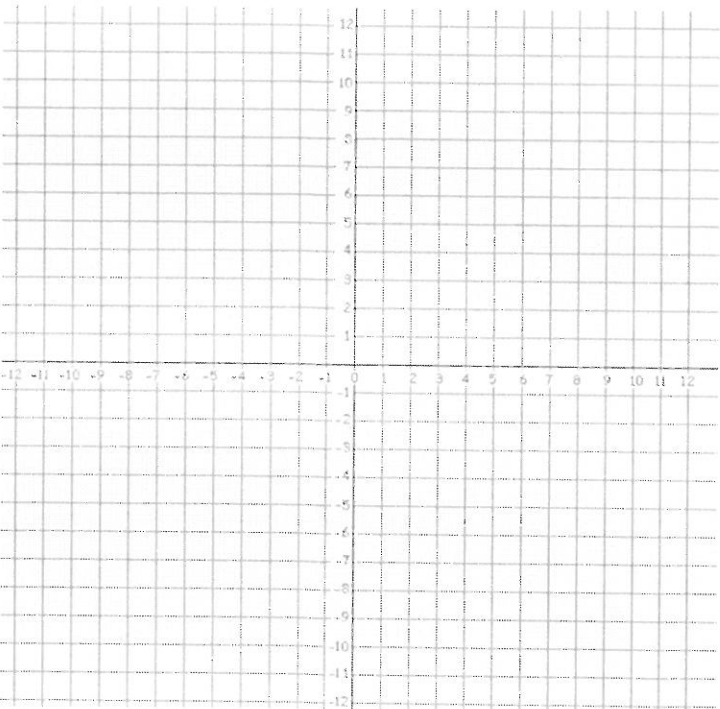
x	y

Comparison to $y = x^2$:

3. Graph $y = 2x^2 - 6x + 2$

Find the vertex:

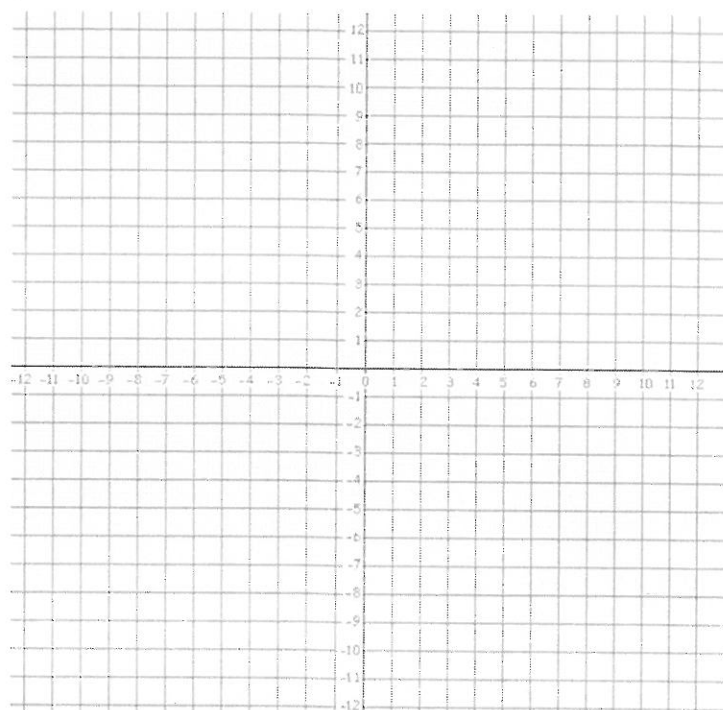
Find the axis of symmetry:



4. Graph $f(x) = -\frac{1}{4}x^2 + 2x + 4$

Find the vertex:

Find the axis of symmetry:



5. Which multiple choice option describes the correct transformation to the parent graph ($a = 2$)?
 $a = -7$ 2

- A. Shrink and shift down 1 units
- B. Stretch and shift down 3 units
- C. Stretch and reflection across the x-axis
- D. Shrink, shift down 3 units, and reflection across the x-axis
- E. Shrink and reflection across the x-axis

6. How would the graph of the function $y = x^2 + 4$ affected if the function were changed to $y = x^2 - 3$?

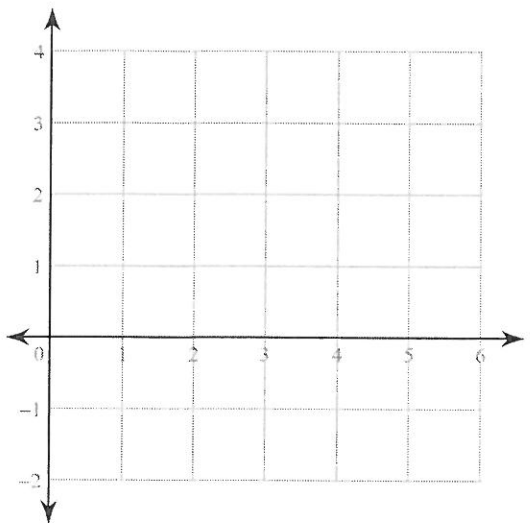
- A. The graph would shift 4 units up.
- B. The graph would shift 3 units down.
- C. The graph would shift 7 units down.
- D. The graph would shift 4 units to the right.
- E. The graph would shift 4 units down.

7. Describe the transformation of $y = 5x^2 - 4$ to the parent function?

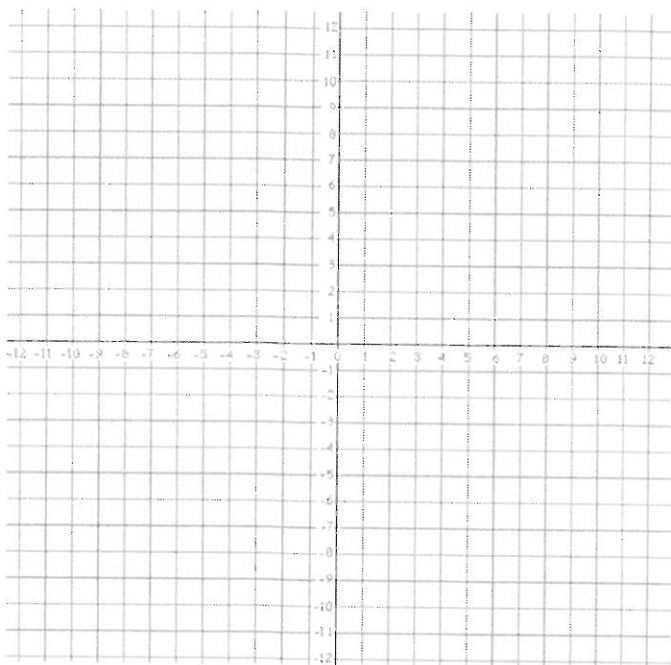
8. How would the graph of the function $y = x^2 - 2$ affected if the function were changed to $y = x^2 + 4$?

9. Solve the equation by graphing. Label the vertex and axis of symmetry.

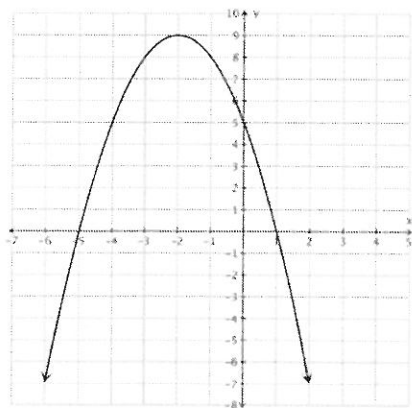
$$y = x^2 - 6x + 8$$



10. Find the zeros, if any, of $-2x^2 - x - 3$. Label the vertex and axis of symmetry.



11. The graph $y = -x^2 - 4x + 5$ is shown below. Which choice best describes the solution(s) to this equation?

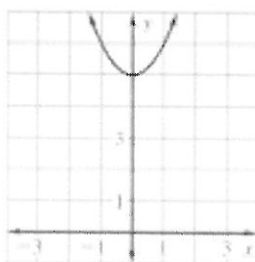


- A. $x = -5$
- B. $x = 5$
- C. $x = 1$
- D. Both A and C

12. Use the graph to find the solution to the equation

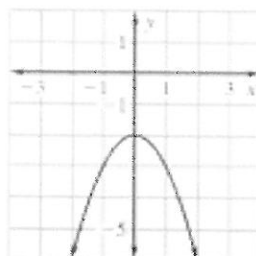
a.

$$x^2 + 5 = 0$$



b.

$$x^2 - 2 = 0$$



13. What are the solutions to the quadratic equation $x^2 + 7x + 10 = 0$?

- A. $x = 2$ and $x = 5$
- B. $x = -2$ and $x = 5$
- C. $x = -5$ and $x = 2$
- D. $x = -5$ and $x = -2$

14. The expressions x^2 and $7x - 12$ are equivalent when x is equal to what value(s)?

15. The expressions $4b^2$ and $-2b + 2$ are equivalent when b is equal to what value(s)?

16. What is the **sum** of the solutions to the equation?

$$12d^2 + 14d - 6 = 0$$

17. What is the sum of the values that would make the following expression undefined?

$$4 - 5 - 36$$

18. Solve the equation $5 + 3p^2 = 38$

Exact answer:

Approximate answer (evaluate radical and round to the nearest hundredth):

19. Solve the equation:

$$2a^2 - 4 = -13$$

20. Solve the equation:

$$4(x + 9)^2 = 24$$

21. Describe and correct the error in solving the equation below:

$$7d^2 - 6 = -17$$

$$7d^2 = -11$$

$$d^2 = -\frac{11}{7}$$

$$d \approx \pm 1.25$$

The solutions are about -1.25 and 1.25 .

22. What is the quadratic formula?

23. What are the roots of $4z^2 = 7z + 2$?

a = ____

b = ____

c = ____

24. Find the roots of

$$4n^2 = 3 - 4n$$

25. Which of the following is a solution for the equation $2x^2 + 5x + 1 = 0$?

a. $x = \frac{-5}{4} + \sqrt{25 - 8}$

b. $x = \frac{5 + \sqrt{25 - 8}}{4}$

c. $x = \frac{-5 + \sqrt{25 - 8}}{4}$

d. $x = \frac{-5 + \sqrt{25 - 8}}{2}$

e. $x = -5 + \frac{\sqrt{25 - 8}}{4}$

26. Describe and correct the error in solving the equation below:

$$-2x^2 + 3x = 1$$

$$x = \frac{-3 \pm \sqrt{(3)^2 - 4(-2)(1)}}{2(-2)}$$

$$= \frac{-3 \pm \sqrt{17}}{-4}$$

$$x \approx -0.28 \text{ and } x \approx 1.78$$

27. The solution set $x = \{2, 5\}$ could be the solution set for which of the following quadratic equations?

a. $x^2 + 3x - 10 = 0$

b. $x^2 - 7x - 10 = 0$

c. $x^2 - 7x + 10 = 0$

d. $x^2 + 7x + 10 = 0$

e. $x^2 - 3x + 10 = 0$

28. Which of the following quadratic equations has the solution set $\{-7, 4\}$?

a. $x^2 - 3x - 28 = 0$

b. $x^2 - 3x + 28 = 0$

c. $x^2 + 3x + 28 = 0$

d. $x^2 + 7x - 28 = 0$

e. None of the above

29. During a cliff dive competition, a diver begins a dive with his center of gravity 70 feet above the water. The initial vertical velocity of his dive is 8 feet per second.

- a. Write an equation that models the height h (in feet) of the divers center of gravity as a function of time (seconds)

$$h(t) = -16t^2 + \underline{\hspace{1cm}}t + \underline{\hspace{1cm}}$$

- b. How long after the diver begins his dive does his center of gravity reach the water?

30. An athlete who is 6.5 feet tall throws a shot put with an initial vertical velocity of 40 feet per second. The height of the shot put can be modeled by the function $h(t) = -16t^2 + 40t + 6.5$. How long will it take for the shot put to hit the ground?

31. Simplify:

$$\left(\frac{2a^{-4}b^{-3} \cdot a^0b^0}{2ab^2 \cdot a^0} \right)^{-1}$$

32. Simplify:

$$\left(\frac{2yx^3}{2x^3y^{-2} \cdot x^{-4}y^4} \right)^{-2}$$

33. Simplify:

$$\left(\frac{m^4n^0 \cdot 2m^4n^{-3}}{2mn^0} \right)^{-4}$$

34. Your classmate says that **0.0000000432** represented in scientific notation is **4.32×10^8** . Is your classmate right or wrong? Explain and show work.

35. Convert the following into scientific notation:

a. 12,000

b. 0.000563

c. 557,000,000

36. Solve the following:

a.

$$(2.3 \times 10^{-6})(2.46 \times 10^5)$$

b.

$$(5 \times 10^{-1})(6.69 \times 10^{-1})$$

37. Solve the following:

a.

$$\frac{3 \times 10^{-2}}{4.2 \times 10^{-2}}$$

b.

$$\frac{3.45 \times 10^6}{7 \times 10^{-2}}$$

Simplify the expression.

1. $\sqrt{45s^3}$

2. $\sqrt{196r^4}$

3. $\sqrt{450c^5}$

4. $\sqrt{124m^4n^{10}}$

5. $11\sqrt{x^7y^8}$

6. $\sqrt{a^3b} \cdot \sqrt{ab}$

7. $\sqrt{27xy} \cdot \sqrt{5y^3}$

8. $\sqrt{\frac{121}{16m^2}}$

9. $\sqrt{\frac{5d^2}{125}}$

Simplify the expression by rationalizing the denominator.

10. $\sqrt{\frac{5}{8}}$

11. $\sqrt{\frac{7m^5}{11}}$

12. $\sqrt{\frac{125}{4x^3}}$

Simplify the expression.

13. $\sqrt{15} + 5\sqrt{3} - 2\sqrt{27}$

14. $\sqrt{7}(3 - 2\sqrt{7})$

15. $\sqrt{2}(3\sqrt{14} - \sqrt{7})$

16. $(3\sqrt{12} + 5)^2$

17. $(8\sqrt{3} + \sqrt{2})(1 - \sqrt{3})$

18. $\sqrt{\frac{250m^3}{2n}}$

19. Simplify:

$2\sqrt{45} + 2\sqrt{5} - \sqrt{27}$

20. Simplify:

$-\sqrt{45} - 2\sqrt{18} - 3\sqrt{8}$

21.

$\sqrt[3]{\frac{x^{15}}{x^9}} = ?$

22. What is $\sqrt[3]{-729}$?

23. Simplify:

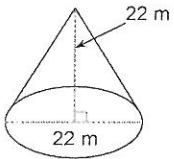
$\sqrt[3]{-375}$

<p>24. When $z = 4$, what is the value of:</p> $\sqrt[3]{\frac{y^3 z^{12}}{27b^6}}$	<p>25. What is the simplest form of the radical $\sqrt[3]{256x^8y^7z}$? (Assume that x and y are nonnegative)</p>	<p>26. What is the simplest form of the radical $\sqrt[3]{\frac{24x^4y^7}{-27x^6y^3}}$?</p>
<p>27. Simplify: $\sqrt{-100}$</p> <p>A) $4i$ B) $5i$ C) $10i$ D) $25i\sqrt{2}$ E) $4i\sqrt{10}$</p>	<p>28. Simplify: $\sqrt{-24}$</p> <p>A) $8i\sqrt{3}$ B) $2i\sqrt{6}$ C) $12i\sqrt{2}$ D) $24i$</p>	<p>29. $(3i + 14) - (7 + 6i) + (2i - 5)$</p>
<p>30. In the standard form,</p> $-3(6 - \sqrt{-25}) = ?$ <p>A) $-18 + 15i$ B) $-18 - 15i$ C) $-18 - 5i$ D) $-3i$</p>	<p>31.</p> $\frac{\sqrt{-36}}{\sqrt{-169}}$	<p>32.</p> $\sqrt{-24w^2} \cdot 3\sqrt{w}$
<p>33. Which real number is equivalent to i^9?</p> <p>A. -1 B. $\sqrt{-1}$ C. 1 D. 9 E. There is no equivalent real number</p>	<p>34.</p> $3i^2(-i^{15})(-5i)$	<p>35.</p> $(-3 + 4i)^2$
<p>36. $(9 - 2i)(-4 + 7i)$</p>	<p>37. $-2i(5 - 3i) + 4(2i)$</p>	

38. The surface area of a rectangular prism is given use the formula $A = 2(lw) + (2l + 2w)h$ where l is the length, w is the width, and h is the height of the prism. Find the surface area of a prism with a length of 5 cm, a width of 6 cm, and a height of 8 cm.

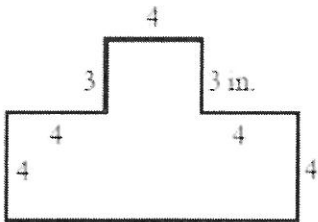
39. A Campbell's soup can has a diameter of 3 inches and a height of 5 inches. Given that the formula for the volume of a cylinder is $V = \pi r^2 h$, how many cubic inches of soup fit in the can?

40. Given that the volume of a cone is $V = \frac{1}{3}\pi r^2 h$, find the volume of the cone below with a height of 22 m and a diameter of 22 m.

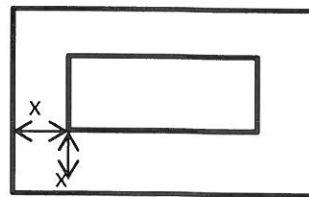


41. The formula of the volume of a prism is $V = lwh$ where l is the length, w is the width and h is the height of the brick. What is the height of a box if its volume is 27 m^3 , its length is 3 m and its width is 3 m?

42. Find the area of the figure below.

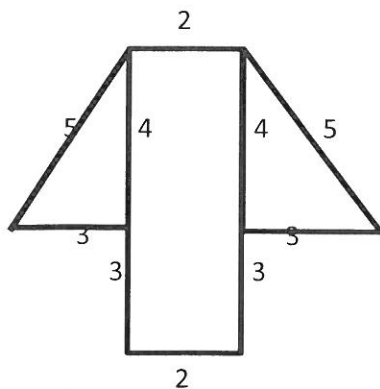


43. A rectangular flower bed is 8×10 feet. It is surrounded by a border of uniform width x feet, as shown in the figure below. If the area of the bordering region alone is 40 square feet, what is the value of x ?

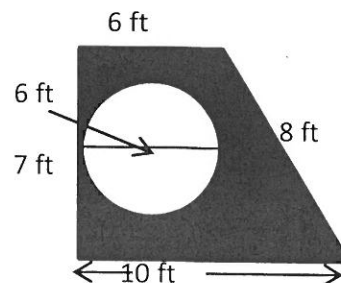


A) 1 B) 2 C) 3 D) 10 E) 11

44. What is the area of the entire hexagon? All measurements are in feet.



45. What is the area of the shaded region? Leave your answer in terms of pi.



Some of the following conjectures are true and some can be proven false using a counterexample. If the statement is true, write the word TRUE in the box. For statements that are false, provide a counterexample.

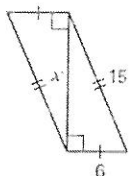
46) Conjecture: Everything that's hot is fried chicken.

47) Conjecture: English is the only language spoken in the United States.

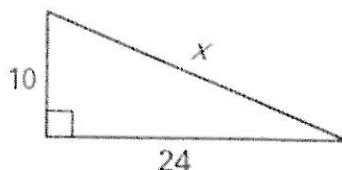
48) Conjecture: The square of an odd integer is odd.

49) Conjecture: If n is a real number then $-n$ is a negative number.

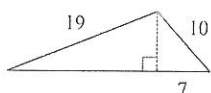
50) Find the missing side length. Reduce all radicals.



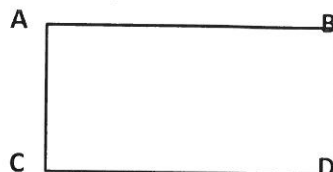
51) Find the missing side length. Reduce all radicals.



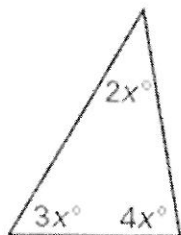
52) Find the area of the triangle below. Round to the nearest hundredth.



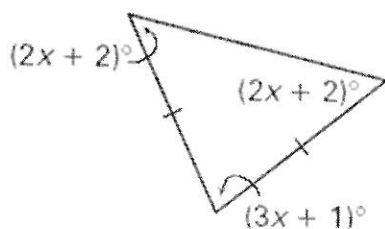
53) A rectangular field shown below is 60 feet wide and 80 feet long. Jaylin and Joyce are at point A. Jaylin walks to point D by walking along the edge of the field through point B. Joyce walks to point D by walking diagonally across the field. About how many meters more does Jaylin walk than Joyce?



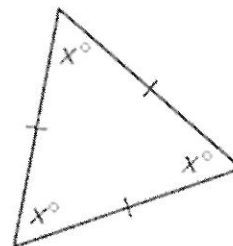
54) Solve for x .



55) Solve for x .



56) Solve for x .

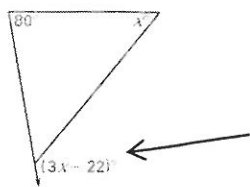


Classified by sides _____
Classified by angles _____

Classified by sides _____
Classified by angles _____

Classified by sides _____
Classified by angles _____

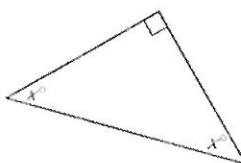
57) Solve for x . Then find the measure of the indicated angle.



Which theorem is used to solve this problem?

- a) Triangle Sum Theorem
- b) Exterior Angle Theorem

58) Solve for x .

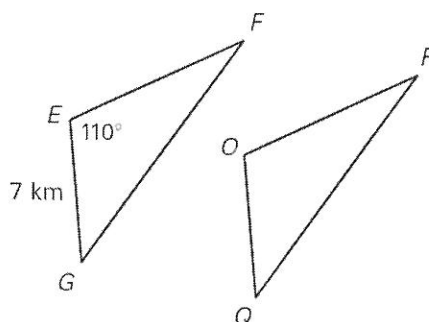


Which theorem is used to solve this problem?

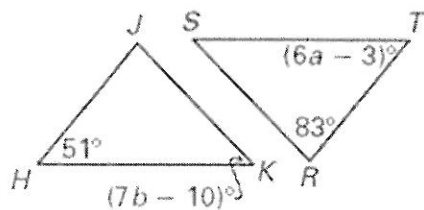
- a) Triangle Sum Theorem
- b) Exterior Angle Theorem

In the diagram, $\triangle EFG \cong \triangle OPQ$. Complete the statement.

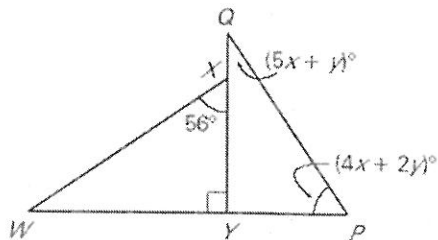
1. $\overline{EF} \cong$ _____
2. $\angle P \cong$ _____
3. $\angle G \cong$ _____
4. $m\angle O =$ _____
5. $QO =$ _____
6. $\triangle GFE \cong$ _____



59. Given $\triangle HJK \cong \triangle TRS$, find the values of a and b .

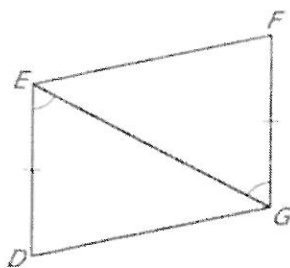


60. Find the value of x and y .

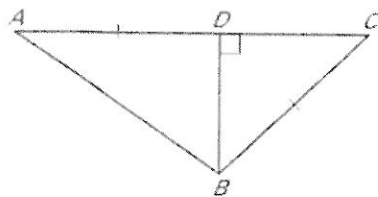


For #61- 66, determine if the two triangles are congruent. If so, write a congruency statement and identify what postulate is needed to prove congruency.

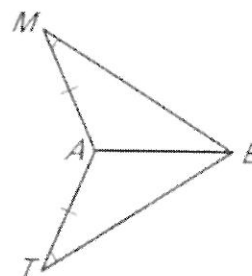
61)

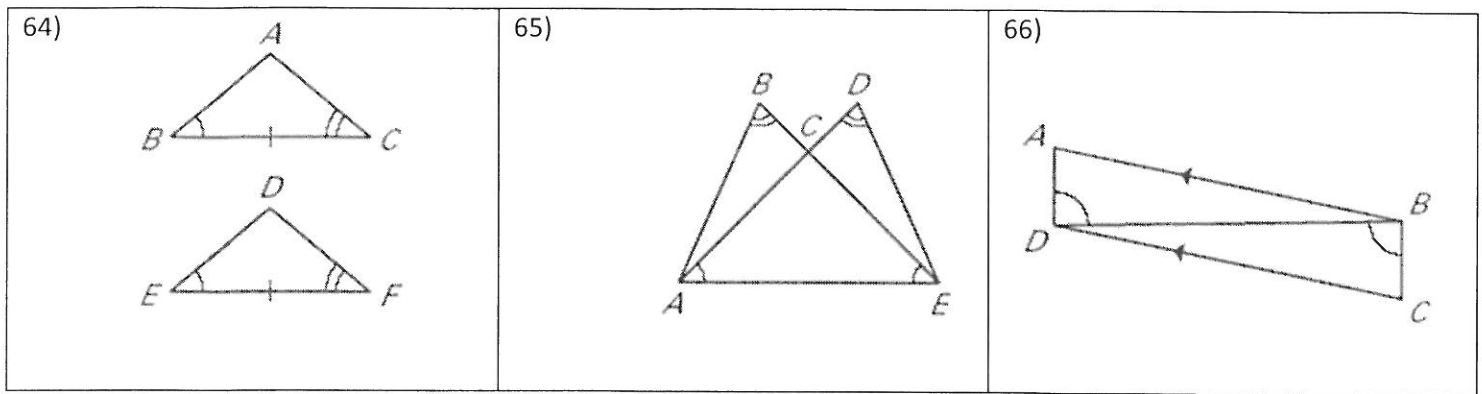


62)



63)





Rewrite the conditional statements in if-then form.

<p>67) The measure of a straight angle is 180°. HYPOTHESIS: CONCLUSION: IF-THEN FORM:</p>	<p>68) Congruent segments are segments that are equal in measure. HYPOTHESIS: CONCLUSION: IF-THEN FORM:</p>
<p>69) Today is Monday if yesterday was Sunday. HYPOTHESIS: CONCLUSION: IF-THEN FORM:</p>	<p>70) A number is divisible by 4 if it is divisible by 8. HYPOTHESIS: CONCLUSION: IF-THEN FORM:</p>

Write the converse, inverse, and contrapositive for each conditional statement that is given. Then decided whether each statement is *true* or *false*.

True/False

71) Conditional Statement	If the weather is warm, then we will go swimming.	
Converse		
Inverse		
Contrapositive		